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HIV Risk Perception: Predicators and its Association with HIV test Result among Sexually Active Mobile HIV Counseling and Testing (MHCT) Clients

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Acronyms

- **AOR**: Adjusted Odds Ratio
- **AIDS:** Acquired Immuno Deficiency Syndrome
- **BSS:** Behavioral Survey Surveillance
- **CDC:** Centre for Disease Control and prevention
- **CSA:** Central Statistics Agency
- **FHI:** Family Health International
- **GAMET:** Global HIV/AIDS Monitoring and Evaluation Team
- **HCT:** HIV Counseling and Testing
- **HIV:** Human Immuno deficiency virus
- **MARP:** Most at Risk Population
- **MHCT:** Mobile HIV Counseling and Testing
- **FMoH:** Federal Ministry of Health
- **MoU:** Memorandum of Understanding
- **OSY:** Out of School Youth
- **PSP-E:** Private Sector Program for TB and HIV Ethiopia
- **RHB:** Regional Health Bureau
- **STIs:** Sexually Transmitted Infections
- **TB:** Tuberculosis
- **UNAIDS:** Joint United Nations Program on HIV/AIDS
- **USAID:** United State Agency for International Development
- **VCT:** Voluntarily Counseling and Testing
- **WHO:** World Health Organization

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Abstract

Background: The identification of individuals' perception of risk is strongly related to the self protecting behavior of individuals. For successful HIV prevention and control program monitoring risk behaviors among persons who are infected or persons who are at highest risk for infection is vital way.

Objective: To assess the association between perceived risks of HIV infection and predictor variables and compare risk perception with test results

Method: This is a cross sectional study based on data routinely collected by service provider for the period of July 2007 and November 2008. Altogether 47,876 clients were included in the study. Descriptive and multivariate analyses performed to determine risk perception

Result: Overall the majority of the respondents viewed themselves as being at no risk of HIV infection. Female clients perceived more risk than male clients and respectively, AOR=1.11 95% CI 1.05- 1.14). Clients who were in previous marital union such as widowed (AOR=2.05, 95% CI: 1.84-2.28) followed by divorced (AOR=1.5) and Separated (AOR=1.21) perceived more risk than their married clients. Employed client 1.29 times more likely to perceive risk than unemployed clients (AOR= 1.29, 95 % CI: 1.24-1.33), risk perception was higher among clients with history of sex for money (AOR=1.40, 95% CI: 1.28-1.53), CSW (AOR=1.9, 95% CI: 1.53-2.36) and clients with history of STI (AOR=1.29, 95% CI: 1.19-1.39) compared to their corresponding reference population categories. As the number of casual partners increase HIV risk perception also increase (X^2= 702.766, p-value= 0.000001). Clients with positive HIV test result 1.45 times more likely to perceive risk of HIV infection than clients with negative test result (AOR=1.45, CI: 1.35-1.57)

Conclusion: Overall the risk perception was low among mobile HCT clients, however HIV risk of infection is perceived more by females, clients in previous marital union, employed and uneducated and clients with risky sexual behavior. The result revealed that risk perception has significant association with individuals HIV test result

Recommendation: Improve behavioral communication approaches to enable people to be aware of their risks that help them to protect from HIV/AIDS and provide targeted HIV prevention service

1. Introduction

It is more than twenty eight years since HIV/AIDS became a global concern, today HIV/AIDS is worldwide crisis and one of the greatest challenges of mankind. HIV/AIDS is one of the deadliest problems that the world has ever faced. Despite many efforts UNAIDS now estimate that globally, 33 million (range: 30.3 to 36.1 million) are living with HIV, women account for half of HIV infections. The global percentage of adults living with HIV has leveled off since 2000(1).

The pandemic is causing matchless impact on the development of many African countries especially the situation is most horrible in sub-Saharan Africa region. About 67% of all those living with HIV worldwide live in sub-Saharan Africa. Globally HIV/AIDS fuelled by poverty is slowing the economic development of most sub-Saharan countries and causing overwhelming situation for poor families. Even though HIV prevalence is slightly stabilized in the developed world and in few developing countries like Brazil, Uganda, Senegal and Thailand, still many African countries are feeling the devastating impact of HIV/AIDS.

In Ethiopia as well HIV/AIDS has affected a considerable portion of population and Nationally HIV/AIDS prevalence rate is estimated to be 2.3% among sexually active adult age 15-49 with urban and rural prevalence of 7.7% and 0.9% respectively (2). HIV/AIDS has largely affected the socio economic development of the country; deteriorate the health status of the population and contributing to humanitarian crises.

Perception of risk is important to study in the era of AIDS because it is a precursor to behavior change, although not an indicator of, which determines future infection/prevention.

The fact that no vaccine to prevent HIV transmission and no cure once the virus has entered the human body as of today behavioral intervention has been found as one the best HIV/AIDS prevention and control mechanism. Many research findings found out that different HIV/AIDS prevention and control programs like VCT helps individuals to reduce high risk behavior and to maintain safer behavior (3). VCT also is an effective way to assess personal risk and to develop risk reduction plan to keep oneself from HIV infection. Studies in many countries also demonstrated that VCT is effective tool in changing risk behavior by reducing the number of sexual partners and increase condom use (4).

HIV/AIDS prevention and control programs should focuses on self-reported risk behavior of individuals that could expose them to acquiring and transmitting HIV infection. For successful HIV prevention and control program monitoring risk behaviors among persons who are infected or persons who are at highest risk for infection is vital way. HIV/AIDS Behavioral Surveillance Survey (BSS) in Ethiopia indicated that many of the respondents had multiple sex partners and reported other high-risk behaviors (5). Many research findings also stressed that there is a need to addresses high risk behavior of individuals through promoting VCT.

In Ethiopia most research failed to analyze the association between perceived risk of HIV infection and risky behavior particularly from data obtained from mobile HCT clients. However, many research conducted in other countries clearly shows that the association between the behavioral risk and perceived risk helps many people to keep themselves from HIV infection.

So the objective of this paper is to compare and determine the self-perceived risk and actual behavioral risk with clients HIV test result. Since behavioral HIV intervention has been one of the pivotal HIV prevention and control mechanism this research will give the correct picture of

the association of perceived risk and actual behavioral risk and contribute in the fight against HIV/AIDS.

The findings will also be helpful to policymakers, program developers, and providers of health services, health educators, parents and those who provide support and guidance to MARPs to enable them to live healthy sexual and reproductive lives.

2. Literature Review

Risky Behavior

Sexual risk behavior especially heterosexual behaviors contribute as one of the major HIV risk behavior. Multiple sexual partners, having sexual intercourse with casual and high risk partners, sexual intercourse without condom, incorrect and inconsistent use of condom, exposure to STI, exchanging sex for money and materials and using drug and alcohol for sexual initiation being the major factors (6). These potentially risky behaviors and cultural norms may influence an individual's actual or perceived risk of HIV infection in Ethiopia

Factors that Influence Risk Perception

Researcher identified six significant predictors of risky sexual practices using regression analysis. These included the number of partners in last six months, religious values, condom attitudes, age at first sex, alcohol intake, and residential locus. Additionally, their literature review identified eight risk factors, which have been shown to be significantly correlated with risky sexual attitudes and behaviors which included age (sexual practices increase as youths get older), gender, race/ethnicity (ethnic minorities tend to engage in more risky sexual practices than do non-Hispanic whites), age at first sex, number of sex partners, age of first alcohol use, binging on alcohol (defined as having four or more drinks on a single occasion), and self-esteem (low self-esteem) has been found to correlate with risky sexual behaviors(7).

Risk Perception

Risk perception is a personal risk-assessment. However, it may not reflect actual risk. It may reflect an individual's level of and access to knowledge. Perceptions should therefore be influenced not just by objective circumstances, but by media campaigns that provide information and, societal views, and norms that mediate their impact (8). Other studies argue that perception is socially constructed in

that social experiences influence the way in which people perceive superficially identical risks (9). For example, the death of someone with AIDS may increase the subjective risk perception among all members of the family or community even though some may be at very low risk

Conversely, where deaths from AIDS are rare or well-hidden, the risk of infection may be perceived as being much lower than is actually the case. Therefore, in order to understand risk taking behavior and behavioral change, it is the subjective risk perception that needs to be studied, as opposed to actual risk.

The study of risk perception is complex mainly because of the difficulty in distinguishing between perceived and actual risk as well as the associated subjectivity. Usually when people asked their HIV risk perception may not portray what they believe, rather they report just how they are expected to answer.

A number of studies have found that perception of risk is strongly related to the self protecting behavior of individuals (10, 11). This is largely because the adoption of protective behaviors, which is unlikely to occur unless the person is well aware of the risk of HIV infection. Studies show that people can judge their risk of HIV infection (12). However, sometimes people who are at risk may not perceive their risk and are less motivated to protect themselves (13). On the other hand, individuals respond differently to the AIDS epidemic and often not rationally. Some adopt the stance “it would never happen to me” where they assume that they are immune to infection for a variety of reasons (14). Such individuals perceive their risk to be zero or negligible and because of this, they may not modify their behavior even when their actual risk is high. Individuals who feel that they have little or no influence over what happens to them are more likely to engage in risky sexual behavior-women are more likely to feel that they do not have control over their situation (14). People in the same situation can have substantially different risk perceptions because of many factors. In particular, women may have a higher risk perception because they lack the

power needed to negotiate in sexual relationships. Evidence suggests that about 25 per cent of Ugandan men and women in their sample believed that a woman cannot refuse sex with her partner, even if she knows that he has AIDS (13). Other studies in show that generally men have greater influence in intimate relationships and women are more vulnerable to infection and unwanted pregnancies (9).

Others however, adopt a fatalist attitude where they decide HIV infection as inevitable and see no point in modifying their behavior. Clearly in countries where AIDS is a real threat, a balance must be reached where people form realistic notions about their own personal risk levels and have the option of making informed behavioral changes. Rosen stock who developed the Health Belief Model suggests that preventative action is more likely among those who feel vulnerable to a disease. This suggests that people have to perceive themselves at risk of HIV infection in order to take preventative action to safer sexual behavior, such as monogamy or condom use (15).

BSS data collects information on how respondents report their perception and the majority of women and men in Ethiopia report that they have little or no chance of being infected with HIV. For example, 77.9% of uniformed people, 80.5% of truckers, 85% of OSY and 48.8% of FSW perceived their risk to be nil or low (19)

In previous study conducted on factory workers participants reported high-risk sexual behaviors, yet had a low perception of individual risk. High-risk sexual behavior was more commonly reported by males when compared with females respectively: 64% and 6% acknowledged more than five sexual partners in their lifetime ($P < 0.001$), and 16% and 2% reported casual sexual partners in the past year ($P < <0.001$).

Although 17% and 2% acknowledged having had sexual activities that had put them at risk of HIV infection in the past, only 1% in each gender said that there was a slight chance that their

HIV test result would be positive. Acknowledging having put themselves at risk for HIV infection was associated in males with number of lifetime partners ($P = 0.001$) (20)

3 Conceptual Framework of HIV Risk Perception

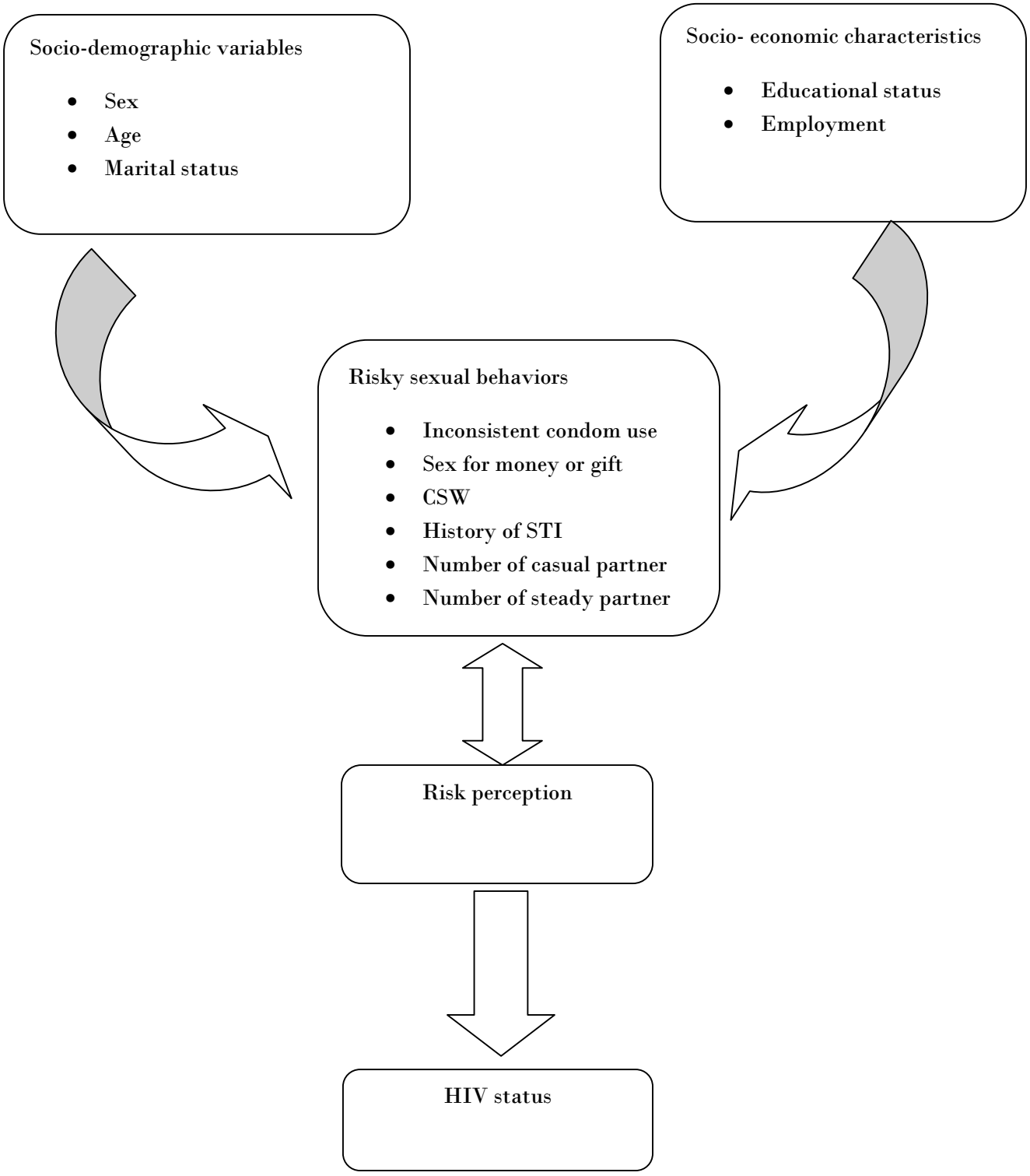

Fig 1 Hypothetical model of risk perception

4. Objective

4.1 General Objective

The general objective of the study is to assess factors associated with participants' perceived risk of HIV infection and compare risk perception with test results of clients of mobile VCT of USAID) | PSP-E.

4.2 Specific Objectives

- To assess clients self- reported risk of acquiring HIV infection
- Compare perceived risk of HIV infection with socio-demographic, sexual behaviors and clients HIV test result

5. Methodology

5.1 Geographic Area

Study areas include 40 urban and semi urban towns of Afar, Amhara and Oromiya regions along the four major transportation corridors which link Ethiopia to Kenya, Djibouti and Sudan. The towns were two from Afar region i.e. Logia and Awash Sebat kilo, eighteen from Amhara region specifically Debre Markos, Bahir Dar, Woreta, Gondar, Metema, Debre Birehan, Dessie, Kombolcha, Kemissie, Woldiya, Dejen, Bure, Chagni, Estie, Debre Sina, Shewa Robit, Ataye and Bati, and the remaining twenty towns such as Dukem, Bishoftu, Modjo, Adama, Batu, Shashemene, Arsi, Negele, Meki, Metehara, Wonji, Negele Borena, Kibre Mengist, Shakiso, Hagere Mariam, Yabello, Mega, Moyale, Chiro, Hirna and Haromaya were from Oromiya region. These towns were selected by the respective Regional Health Bureaus (RHBs) based on the number of MARPs, town's HIV prevalence and population size of the town.

5.2 Study Design

A cross sectional analysis of secondary data collected in PSP-E MHCT program in 40 towns of three regions.

5.3 Study Population

The study population was all sexually active clients who voluntarily pass through counseling and testing in forty towns where USAID/PSP-E implement MHCT service.

5.4 Sampling

Of 69,141 clients who utilized MHCT service in PSP-E MHCT operated areas from July 2007 to November 2008 only sexually active clients were selected and included in study

5.5 Sample size

All 47,876(100%) sexually active clients who got the service during the specified period were included in the study

5.6 Data Collection Tools and Procedures

For this study secondary data that was collected during MHCT service by PSP-Ethiopia is used. The organization adopted client intake form from the national HCT guideline to collect and record data throughout service delivery time. The format has seven parts– a part which filled by a receptionist, Demographic Characteristics, Pre- test counseling, Risk assessment, TB history, Laboratory result and Post-test counseling. Although the language of the instrument was English, interview was made mainly by Amharic and Oromiffa based on the clients preference. In order to maintain quality of service trained nurse counselors with basic HCT training and who were familiar with local language and culture filled the client intake form. A team of MHCT supervisors checked the completeness and consistency of the data during data collection time through random collection of client intake form. All tests were done using serial rapid HIV test algorithm. Majority of tests were done using former test algorithm (Determine for screening, Capillus for confirmatory test and Unigold for tie breaker test), starting from October 2008 the service provider used the new test algorithm (KHB for screening, Stat pack for confirmatory and Unigold for tie breaker test). Regional lab validate the test result through blind rechecking by randomly collecting 10% of negative test results and 100% positive test results.

5.7 Variables Specification

Dependent Variable

The dependent variable measured was the presence or absence of HIV risk perception.

Independent Variables

The explanatory variables that influence perceived risk of HIV infection were selected on the basis of the literature review. The independent variables measured were

- Socio-demographic variable: Age, sex and marital status
- Socio- economic variables: education and employment status
- Sexual behavior: Condom use last sex, condom use last three months, sex for money, CSW, history of STI in life time, steady partner last six months and casual partner last six months

5.8 Operational Definition

Algorithm: A systematic sequence to perform blood test for HIV.

Anonymous: Collecting client's information and doing blood test for HIV using code only.

Casual sexual partner: Someone not a spouse or not a steady partner

Client: The person who receives mobile HIV counseling and testing (MHCT) services.

MHCT- Temporary VCT service within towns which stays for a week or two weeks in a town

HIV Test: A laboratory procedure that detects antibodies to HIV.

Negative Test Result: Blood specimen that is nonreactive on a screening test

Positive HIV Test: Blood specimen that is reactive on screening test, repeatedly reactive on a confirmatory test on the same specimen, or nonreactive on confirmatory test but reactive on tie breaker test

Risk: Likelihood that an individual will contract HIV infection

Risk Perception: One's own judgment about the chance of being infected by HIV.

Risk Perception Yes: If the clients reported either "client had risk, partner had risk, not trust partner, ill/symptoms, death/illness of partner, occupational exposure, blood/fluid exposure, sexual assault, positive or I don't know" for "What is the most important reason to be here today/ to be tested ?" and "What type of result do you expect?" questions.

Risk Perception No: If the clients reported either premarital, marital reunion, pre pregnancy planning, pregnant, visa applicant get counseling any future planning , confirm positive result, pre ART, referred, second window test or negative for "What is the most important reason to be here today/ to be tested ?" and "What type of result do you expect?" questions.

Risky Sexual Behavior: involvement in unsafe sexual practice that could expose to HIV infection.

Sexual Behavior: Sexual practice of clients.

Steady partner: A boy friend /fiancé/ someone in consensual union

Voluntary Counseling and Testing: A confidential dialogue between client and a counselor aimed at to cope with stress and to take informed decision related to HIV/AIDS.

5.9 Data Analysis

Data were entered on a computer using Epi- Info and exported to Statistical Package for Social Science (SPSS version 13) software to carry out the analysis. Frequency distribution of variables was derived and bi-variate used for cross tabulations. Statistical level of significance were set at $p<0.05$ with 95% confidence interval. Relationship of self perceived risk of HIV infection, with socio demographic, socio economic status, sexual behavior and test result were evaluated using logistic regression analysis, confidence interval and odds ratio. Trend analysis also done using Epi-Info version 6.

6. Ethical consideration

PSP-Ethiopia has signed memorandum of understanding (MoU) with respective Regional Health Bureaus prior to the commencement of the mobile HIV counseling and testing. Data were recorded anonymously in the client intake form with pre coded arbitrary number in the form, and each form is kept confidential in PSP-E office monitoring and evaluation unit. Moreover, the information is recorded after communicating and getting informed consent of each client. Despite the fact that, clients decided by their own to come and use mobile counseling and testing service, all of them were asked their willingness to continue with the testing and respond to some questions. The consent statement was read by the counselor for each client and approval sought in advance before testing. (The consent form attached with the client intake form).PSP-Ethiopia as well provided me a permission letter to conduct the analysis. Furthermore, the HCT service had posttest counseling session that helps clients particularly HIV positive clients to experience positive living and disclose their status. Positive clients were also referred in a place where there is chronic HIV care and care and support service based on the client preference.

7. Result

7.1 Characteristics of Respondents

The data shows that majority 30,309 (63.3%) of the clients were male with nearly 1.73 to 1 sex ratio. The mean age of 47876 clients was 29.1 years (SD 29.1±10.8). About two fourth of the clients (74.9%) were in the age group 15-34 years (Table 1). Regarding the clients' marital status the majorities was married and single (40.5 % and 39.8%) respectively. Being married is higher among female than males, on the other hand being single is apparently higher in males than female sex. On the other hand separated, divorced and widowed/er were comparatively higher in female than male sex (Table 1).

MHCT clients included various educational categories, 21,655 of male clients which is about 72.1% had attained primary and secondary level education, while the corresponding proportion for females was 54.8%. Thirty seven percent of female respondents had never attended school compared to only 14.8% of males (Table 1).

At the time of the survey 29,626 (64 %) of the respondents were employed and the remaining 16,080(35.2%) were unemployed. Among males 76.5% and among females 45.1% of clients were employed (Table 1).

Table 1: Socio- Demographic characteristics of MHCT clients by sex in 40 towns, Ethiopia July 2007- November 2008

Variable	Response	Total Clients N (%)	Male N (%)	Female N (%)
Age	15 - 19	6118(12.8)	2859(9.4)	3259(18.6)
	20 - 24	14079(29.4)	9425(31.1)	4654(26.5)
	25 - 29	9754(20.4)	6555(21.6)	3199(18.2)
	30 - 34	5832(12.2)	3841(12.7)	1991(11.3)
	35 - 39	4192(8.8)	2520(8.3)	1672(9.5)
	40 -44	2796(5.8)	1734(5.7)	1062(6.0)
	45 - 49	1964(4.1)	1244(4.1)	720(4.1)
	50 and above	3141(6.6)	2131(7.0)	1010(5.7)
Group Total		47876	30309	17567
Marital status	married	19339(40.5)	11044(36.6)	8295(47.3)
	never married	19007(39.8)	15159(50.2)	3848(22.2)
	separated	2097(4.4)	1031(3.4)	1066(6.1)
	divorced	4672(9.8)	1850(6.1)	2822(16.1)
	widowed	1546(3.2)	390(1.3)	1156(6.6)
	living together	372(0.8)	213(0.7)	159(0.9)
	engaged	688(1.40)	507(1.7)	181(1.0)
Group Total		47721	30194	17527
Education level	illiterate	10939(23.1)	4441(14.8)	6498(37.4)
	able to read	1585(3.3)	1017(3.4)	568(3.3)
	primary	16099(34.0)	10754(35.8)	5345(30.8)
	secondary	15067(31.8)	10901(36.3)	4166(24.0)
	tertiary	3698(7.8)	2899(9.7)	799(4.6)
Group Total		47388	30012	17376
Employment	not employed	16080(35.2)	6726(23.5)	9354(54.9)
	employed	29629(64.8)	21934(76.5)	7695(45.1)
Group Total		45709	28660	17049

When we see the clients behavior related characteristics 34,619(75%) of clients did not used condom during their last sex. Relatively males practiced condom use during their last sex compared to females (31.2% and 14.3%) respectively. Male clients were consistently used condom during the last three months more than their female counterparts. Overall consistent condom use was low (10.8% among males and 5.4% among females).

Among sexually active women 7.1% of clients reported history of sex for money or gift and 5.2% of sexually active clients were commercial sex worker.

Ten thousand five hundred two (21.9%) clients reported to have more than one casual partner during last six months. Relatively high proportion of male clients reported multiple sexual partners during last six months compared to females (25.6% and 15.6%) respectively.

Forty seven thousand three hundred fifteen (98.8 %) clients reported to have nil and one steady partner during the last six months.

History of STI was reported by 3480(7.4%) of the clients. Male clients reported more history of STI in their life time than female clients 2685 (9.0%) and 795(4.6%) respectively (Table 2)

Table 2: MHCT sexual behavior by sex in 40 towns, Ethiopia July 2007- November 2008

Variable	Response	Total Clients N (%)	Male N (%)	Female N (%)
Condom use last sex	no	34619(74.9)	20201(68.8)	14418(85.7)
	yes	11583(25.1)	9168(31.2)	2415(14.3)
Group Total		46202	29369	16833
Had sex for money	no	44621(94.3)	28441(95.1)	16180(92.9)
	yes	2715(5.7)	1476(4.9)	1239(7.1)
Group Total		47320	29901	17419
Condom last 3month	Never	37226(78.1)	22101(73.3)	15125(86.5)
	Sometimes	6213(13.0)	4783(15.9)	1430(8.2)
	Always	4199(8.8)	3260(10.8)	939(5.4)
Group Total		47638	30144	17494
STI history	No	43830(92.6)	27259(91.0)	116571(95.4)
	Yes	3480(7.4)	2685(9.0)	795(4.6)
Group Total		47310	29944	17366
CSW	No	16537(94.8)		16537(94.8)
	Yes	910(5.2)		910(5.2)
Group Total		47349		17447
Casual partner last 6 month	0	37374(78.1)	22542(74.4)	14832(84.4)
	1	6358(13.3)	4516(14.9)	1842(10.5)
	2	1644(3.4)	1371(4.5)	273(1.6)
	3 and above	2500(5.2)	1880(6.2)	620(3.5)
Group Total		47876	30309	17567
Steady partner last 6 month	0	23312(48.7)	15348(50.6)	7964(45.3)
	1	24003(50.1)	14561(48.0%)	9442(53.7)
	2 and above	5619(1.2)	400(1.3)	161(0.9)
Group Total		47876	30309	17567

7.2 Self Perceived Risk of HIV infection

Among 47787 sexually active clients 93% were tested negative for HIV and 7% were positive for HIV. Overall prevalence is higher among females than males (10.7% and 4.8%) respectively. Of sexually active clients 28, 295 (59.2%) perceived no risk of HIV infection. Even if the overall risk perception was low, the proportion of perceiving risk of HIV among female respondents was higher than among male clients (41.6% versus 40.3%). Female clients 1.13 times more likely to perceive risk of HIV infection than their male counterparts (AOR=1.13, 95% CI 1.08- 1.19)

By marital status, higher risk perception reported among clients previously who were in marital union; widowed clients 1.85 times more likely to perceive risk of HIV infection than married clients (AOR=1.85, 95% CI: 1.65-2.07) followed by divorced (AOR=1.37, 95% CI: 1.27-1.47). Male clients in never married and engaged category perceived more risk than female clients in the same category (AOR=:1.21, 95% CI: 1.12-1.30 and AOR= 1.53, 95% CI: 1.27-1.84) respectively.

An inverse relationship noted between clients level of education and their risk perception of HIV infection. Clients in the able to read category perceived significantly higher risk perception (AOR=1.25, 95% CI: 1.12-1.40) than clients in tertiary educational level.

Generally employed clients significantly perceived higher risk of HIV infection compared to unemployed clients (AOR= 1.19, 95 % CI: 1.14-1.1.24)

The finding of condom use during last three months revealed that clients who never used condom (33%) and who used sometimes (26%) less likely to perceive risk of HIV infection compared to always condom users.

Clients who had had history of sex for money significantly perceived risk of HIV infection than clients who did not have the history (AOR=1.40, 95% CI: 1.28- 1.53). Male clients perceived more risk of HIV infection than female clients (AOR=1.55, 95% CI 1.40-1.73 and 1.18, 95% CI: 1.00-1.38) respectively. CSW also 1.9 times more likely to perceive risk of HIV infection than their female counterparts (AOR=1.9, 95% CI: 1.53-2.36). Having had history of STI significantly associated with perceived risk of HIV infection than clients who did not have history of STI (AOR=1.29, 95% CI: 1.19-1.39)

A dose- response association was observed between the number of sexual partners in the last six months and the risk of perception. Chi square for trend analysis also shows as the number of casual partners increased HIV risk perception also increased in the same pattern(X^2= 702.766, p-value= 0.000001). Multivariate analysis also showed significant association, clients who had one partner (AOR1.35, 95% CI: 1.27-1.43) with 2 partner (AOR=2.1, 95% CI: 1.89-2.34) and clients who had 3 or more partner during the last six months (AOR=2.2, 95% CI: 2.00-2.42).

Clients who had one steady partner during last six months perceived higher risk of infection (AOR=1.14, 95% CI: 1.09-1.19) than clients who did not have clients but clients who had 2 and more partner during last six months 23% less likely to perceive risk of HIV infection than clients with no partner .(Table 4)

7.3 Risk perception versus Test result

Of the total respondents 28,295(59.2%) were never perceived risk of HIV infection and only 19,464 (40.8%) consider themselves at risk for getting HIV infection. Female clients perceived more risk than their male counterparts (41.6% and 40.3%) respectively (Table 4). The analysis revealed that having perceived risk of HIV infection have significant association with HIV test

result. Clients with positive HIV test result 1.45 times more likely to perceive risk of HIV infection than clients with negative test result (AOR=1.45, CI: 1.35-1.57). Female clients with positive HIV test result perceived more risk than their male counterparts (AOR=1.49, 95% CI: 1.35-1.66 and AOR=1.44, 95% CI: 1. 28- 1.61) respectively (Table 4).

Table 3: Crude Odds Ratio and 95% CI of the risk factors for risk perception of HIV infection among sexually active clients, 40 towns, Ethiopia July 2007-november 2008

		All		Male		Female	
		Model 1		Model 1		Model 1	
Sex	Male	30237(40.3)	1.0				
	Female	17522(40.6)	1.11(1.08-1.15)				
Age	50 and	3138(40.2)		2859(9.4)		3259(18.6)	
	above		1.0		1.0		1.0
	15-19	6099(41.9)	0.50(0.47-0.54)	9425(31.1)	0.49(0.45-0.54)	4654(26.5)	0.49(0.43-0.56)
	20- 24	14040(41.8)	0.73(0.68-0.79)	6555(21.6)	0.72(0.66-0.79)	3199(18.2)	0.76(0.67-0.87)
	25- 29	9725(40.7)	0.91(0.84-0.98)	3841(12.7)	0.93(0.85-1.02)	1991(11.3)	0.86(0.75-0.99)
	30-34	5818(39.9)	0.96(0.89-1.05)	2520(8.3)	0.96(0.87-1.07)	1672(9.5)	0.97(0.83-1.12)
	35- 39	4188(40.3)	0.98(0.89-1.07)	1734(5.7)	1.00(0.89-1.12)	1062(6.0)	0.91(0.79-1.06)
	40- 44	2792(38.5)	0.93(0.84-1.03)	1244(4.1)	0.93(0.82-1.06)	720(4.1)	0.91(0.77-1.08)
	45-49	1960(37.3)	0.88(0.79-0.99)	2131(7.0)	0.84(0.73-0.97)	1010(5.7)	0.93(0.77-1.12)
Marital	Married	19294(35.8)	1.0	11044(36.6)	1.0	8295(47.3)	1.0
status	Never						
	married	18964(43.4)	0.75(0.72-0.78)	15159(50.2)	0.83(0.79-0.87)	3848(22.2)	0.61(0.57-0.65)
	separated	2090(42.2)	1.23(1.13-1.34)	1031(3.4)	1.19(1.05-1.35)	1066(6.1)	1.24(1.10-1.40)
	divorced	4659(46.9)	1.55(1.45-1.65)	1850(6.1)	1.62(1.47-1.780	2822(16.1)	1.45(1.34-1.58)
	Widowed	1545(52.0)	1.89(1.71-2.09)	390(1.3)	2.35(1.94-2.85)	1156(6.6)	1.67(1.48-1.88)
	living						
	together	371(35.0)	1.00(0.83-1.20)	213(0.7)	0.85(0.67-1.09)	159(0.9)	1.25(0.94-1.66)
	engaged	684(43.1)	1.10(0.96-1.26)	507(1.7)	1.22(1.04-1.44)	181(1.0)	0.89(0.69-1.15)
Education	Illiterate	12674(39.8)	1.0	4441(14.8)	1.0	6498(37.4)	1.
	Able to read	1973(42.0)	1.10(1.00-1.21)	1017(3.4)	0.99(0.88-1.12)	568(3.3)	1.47(1.25-1.73)
	Primary	21868(35.4)	0.83(0.79-0.87)	10754(35.8)	0.88(0.82-0.93)	5345(30.8)	0.82(0.77-0.88)
	Secondary	25698(29.5)	0.63(0.61-0.66)	10901(36.3)	0.71(0.66-0.75)	4166(24.0)	0.55(0.52-0.59)
	Tertiary	5902(28.8)	0.61(0.57-0.66)	2899(9.7)	0.65(0.60-0.71)	799(4.6)	0.60(0.53-0.68)
Employment	Unemployed	16035(37.8)	1.0	6726(23.5)	1.0	9354(54.9)	1.0
	Employed	29568(41.2)	1.52(1.47-1.57)	21934(76.5)	1.70(1.62-1.78)	7695(45.1)	1.50(1.42-1.59)
Condom last	No	34534(40.6)	0.78(0.75-0.81)	20201(68.8)	0.77(0.73-0.80)	14418(85.7)	0.74(0.68-0.80)
sex	Yes	11558(43.7)	1.0	9168(31.2)	1.0	2415(14.3)	1.0
Condom last	Never	14707(39.6)	0.67(0.67-0.71)	22101(73.3)	0.45(0.42-0.48)	15125(86.5)	0.46(0.41-0.53)
3 months	Sometimes	2598(41.9)	0.74(0.63-0.80)	4783(15.9)	0.71(0.65-0.78)	1430(8.2)	0.77(0.66-0.91)
	Always	2077(49.5)	1.0	3260(10.8)	1.0	939(5.4)	1.0
Sex for	No	44499(39.7)	1.0	28441(95.1)	1.0	16180(92.9)	1.0
money	Yes	2708 (59.3)	2.69(2.50-2.89)	1476(4.9)	2.59(2.35-2.85)	1239(7.1)	2.78(2.49-3.11)
CSW	No	46116(40.3)	1.00			16537(94.8)	1.00
	yes	910(69.1)	4.43(3.92-5.02)			910(5.2)	4.02(3.50-4.62)
STI	No	43830(92.6)	1.0	27259(91.0)	1.0	116571(95.4)	1.0
	Yes	3473(49.4)	2.02(1.89-2.15)	2685(9.0)	2.04(1.90-2.20)	795(4.6)	2.08(1.82-2.38)
Casual	0	37276(38.3)	1.0	22542(74.4)	1.0	14832(84.4)	1.0
partner	1	6343(43.1)	1.72(1.64-1.81)	4516(14.9)	1.92(1.81-2.05)	1842(10.5)	1.39(1.26-1.53)
	2	1642(56.2)	2.95(2.67-3.25)	1371(4.5)	3.13(2.81-3.48)	273(1.6)	2.83(2.23-3.59)
	3 & above	2499(61.7)	3.63(3.35-3.94)	1880(6.2)	3.58(3.26-3.93)	620(3.5)	4.35(3.67-5.15)
Steady	0	23250(43.0)	1.0	15348(50.6)	1.0	7964(45.3)	1.0
partner	1	23949(38.6)	1.3491.30-1.38	14561(48.0)	1.34(1.28-1.39)	9442(53.7)	1.32(1.25-1.39)
	2 and above	561(42.4)	1.59(1.35-1.88)	400(1.3)	1.52(1.25-1.85)	161(0.9)	1.81(1.33-2.45)
HIV result	Negative	44344(39.9)	1.0	28806(95.2)	1.0	15650(89.3)	1.0
	Positive	3329(51.8)	2.14(2.00-2.29)	1449(4.8)	2.05(1.86-2.27)	1882(10.7)	2.16(1.97-2.36)

Table 4: Adjusted odds ratio and 95% CI of the risk factors for risk perception of HIV infection among sexually active clients, 40 towns, Ethiopia July 2007-november 2008

		All AOR(95% CI for AOR	Male AOR(95% CI for AOR	Female AOR(95% CI for AOR
Sex	Male	1		
	Female	1.13(1.08-1.19)		
Age	50 and above	1.0	1.0	1.0
	15- 19	0.88(0.80-0.98)	0.89(0.78-1.02)	0.90(0.77-1.06)
	20- 24	1.04(0.95-1.14)	1.01(0.90-1.14)	1.04(0.89-1.21)
	25- 29	1.05(0.96-1.15)	1.04(0.92-1.16)	0.99(0.85-1.16)
	30 - 34	1.02(0.92-1.12)	0.97(0.86-1.09)	1.05(0.89-1.24)
	35- 39	1.00(0.90-1.10)	0.99(0.87-1.12)	0.96(0.81-1.14)
	40- 44	0.92(0.83-1.03)	0.90(0.79-1.04)	0.92(0.77-1.11)
	45- 49	0.90(0.79-1.01)	0.86(0.73-1.00)	0.94(0.77-1.15)
Marital status	Married	1.0	1.0	1.0
	Never married	1.1(1.04-1.16)	1.21(1.12-1.3)	0.95(0.86-1.05)
	Separated	1.12(1.02-1.24)	1.14(0.99-1.31)	1.16(1.01-1.34)
	Divorced	1.37(1.27-1.47)	1.47(1.31-1.64)	1.33(1.2-1.48)
	Widowed	1.85(1.65-2.07)	2.44(1.96-3.03)	1.65(1.43-1.91)
	Living together	0.95(0.76-1.18)	0.79(0.58-1.06)	1.28(0.92-1.78)
	Engaged	1.31(1.12-1.54)	1.53(1.27-1.84)	0.99(0.74-1.34)
Education	Illiterate	1.00	1.00	1.00
	Able to read	1.25(1.12-1.40)	1.14(0.99-1.31)	1.58(1.32-1.89)
	Primary	0.99(0.94-1.04)	0.99(0.92-1.07)	1.01(0.93-1.09)
	Secondary	0.88(0.83-0.93)	0.92(0.85-1.00)	0.84(0.77-0.92)
	Tertiary	0.84(0.78-0.91)	0.84(0.76-0.93)	0.96(0.83-1.12)
Employment	Unemployed	1.0	1.0	1.0
	Employed	1.19(1.14-1.24)	1.32(1.24-1.40)	1.12(1.05-1.20)
Condom last sex	No	0.97(0.90-1.04)	0.97(0.90-1.06)	1.05(0.89-1.24)
	Yes	1.0	1.0	1.0
Condom last 3 months	Never	0.81(0.74-0.88)	0.83(0.76-0.92)	0.73(0.60-0.88)
	Sometimes	0.74(0.68-0.81)	0.74(0.68-0.82)	0.73(0.61-0.87)
	Always	1.0	1.0	1.0
Sex for money	No	1.0	1.0	1.0
	Yes	1.40(1.28-1.53)	1.55(1.40-1.73)	1.18(1.00-1.38)
CSW	No	1.0	1.0	1.0
	Yes	1.90(1.53-2.36)		1.90(1.53-2.36)
STI	No	1.0		1.0
	Yes	1.29(1.19-1.39)	1.31(1.20-1.43)	1.24(1.06-1.44)
Casual partner	0	1.0	1.0	1.0
	1	1.35(1.27-1.43)	1.47(1.37-1.58)	1.07(0.97-1.19)
	2	2.10(1.89-2.34)	2.20(1.96-2.48)	1.62(1.25-2.10)
	3 and above	2.20(2.00-2.42)	2.32(2.08-2.57)	1.75(1.38-2.22)
Steady partner	0	1.0	1.0	1.0
	1	1.14(1.09-1.19)	1.11(1.06-1.18)	1.19(1.11-1.28)
	2 and above	0.77(0.64-0.92)	0.81(0.65-1.01)	0.73(0.52-1.03)
Test result	Negative	1.0	1.0	1.0
	Positive	1.45(1.35-1.57)	1.44(1.28-1.61)	1.49(1.35-1.66)

8. Discussion

This study found that risk perception is lower among sexually active clients however, female clients perceived more risk than their male counterparts. Sexual behavior such as condom use during last three months, having had sex for money, being CSW, having had history of STI, having casual sex partner and steady sex partner have found to be predictors of perceived risk of HIV infection. Among socio- economic variables being employed, education and marital status found to be predictors of risk perception. Unlike female client male clients in never married and engaged category perceived more risk of infection. On the other hand separated female clients perceived more risk of HIV infection than their male counterparts. This study found that clients self perceived risk of HIV infection was strongly associated with their positive HIV test result.

Being female is found to be a factor for perceiving higher risk of HIV infection. A study conducted in Uganda also revealed that women felt at greater risk of HIV infection than men (21) For women, perception of risk was often associated with a belief that their husbands or male partners had other sexual partners (22, 23) women may have a higher perception of risk because they lack the power needed to negotiate in sexual relationships (24)

The study found that formerly married (widowed/divorced/separated) clients had relatively higher risk perception. For a number of reasons these group of people more likely to engage in risky sexual behavior than other groups of marital status. It may also be a result of their evaluation of the risk of their partners. Females who are widowed, divorced or separated are usually more vulnerable to risky sexual behavior mainly due to economic reasons because they often have to financially fend for themselves (and perhaps for their children as well) having been deprived of their former livelihood. The Ethiopian demographic and health survey result also indicated that women in the

poorest wealth quintile are more likely to be in a polygamy nous union than other women (19). Risk perception associated with never married and engaged male clients could be related with initiation of premarital sex in the early age of their life. In the EDHS result also indicated male respondents were sexually active before marriage (19).

The study found that risk perception is lesser as the clients' education is increased. This might be the result of HIV/AIDs information in the past time that later helped them to prevent themselves from the risk of infection and to perceive less risk of HIV infection or education might provided the clients with a level of assertiveness that allows them to practice safer sex. DHS result also clearly indicated that education is directly related to both correct knowledge concerning common misconceptions and comprehensive knowledge of HIV/AIDS prevention and transmission. In the other hand, individuals with little or no education tend to have poor access to information on safe sex and are less likely to use condoms (19).

Risk of HIV infection perceived more by employed clients than unemployed clients. This might be because of the fact that those who were employed have the resource to access sexual practices. Finding of high HIV prevalence among women and men in the highest wealth quintile in the Ethiopian demographic and health survey could support this finding (19).

It is important to note that perception of risk is also likely to be influenced by condom use (25). As it can be observed from the logistic regression model respondents who never used condom and who used condom sometimes are less likely to perceive risk of HIV infection than consistent condom users. First of all, it is very difficult to determine the behavior of an individual with in a shorter reference (three months) period. Secondly, indeed it could be the actual perception reported by married, living together and respondents having had other type of steady partner such as boy friend/ girl friend.

One of the strongest correlate of risk perception among MHCT clients was having had history of sex for money or gift. It might arise from their risky sexual practiced by losing the power to negotiate on safer sex because of the incentive they received. However, their perception is a good indication for the clients to adopt a healthier behavior.

Another strong association of risk perception observed among CSW clients. BSS finding depicts that only 22.5% female commercial sex worker perceived their risk to be high and moderate (19). The improvement in risk perception may be a result of HIV prevention efforts that are being implemented. This entails that Commercial Sex Workers are at least aware of the risk of their practice.

In this study ever having STI is one of the predictor variables which is found to have a significant association with the perception of risk. Having another STI both make HIV positive persons more infectious and make HIV negative persons more susceptible to infections. Some STIs increase the replication of HIV (24) the knowledge of this association might be enabled them to perceive risk of HIV infection. HIV/AIDS education study from Kenya similarly revealed STI as a marker of risky sexual behavior (26)

In this study having casual partner in the past six months was found strongly associated with clients risk perception. It is clear that as the number of sexual practice increased the risk of acquiring HIV will also increased. Several studies have shown that the risk of HIV infection increased with the number of one's sexual partners. Men and women who engaged in multiple sexual partnerships are directly at risk of HIV infection because of their own sexual behavior (19).

In this study even if overall risk perception was found to be low clients who were tested positive correctly perceived their risk of HIV infection. Having correct assessment of personal risk of

HIV infection is important for the target population to take appropriate measures to protect themselves against HIV/AIDS. This has also an impact on their adherence to health care provided for these individuals.

9. Strength and Limitations

One of the main strength of this study is using large sample size because as the sample size increased it gives the real picture of the study population. The other point is the service provider used trained nurse counselors for data collection that helps to improve data quality and the assessment of risk perception. Covering wider geographic area could also be taken as the strength of this study.

This study has several limitations, first of all clients voluntarily came and utilized the service for testing, as a result it is subjected to selection bias. Since the data collection relied upon self-reports there may be some recall bias of the different behaviors. Also, because of the sensitive nature of the behaviors asked about in the survey, people may have under or over reported certain behaviors (social desirability bias). The client intake format was not comprehensive in terms of some questions it asks about risk perception and sexual behavior. Since clients are not representative the counseling and testing data cannot be used to estimate for the general population. Even if, it is useful to avoid recall bias and used to know recent practices, measuring sexual behavior within a short period of time is less sensitive in tracking individual's behavioral pattern. Finally, as this is a cross-sectional survey, we are not able to determine the temporal or causal relationship between the cognitive and behavioral factors reported in this study. In spite of these limitations, the results from this study provide important information that has implications for future HIV/AIDS education in the country

10. Conclusion

- Overall the risk perception was low among mobile HCT clients
- There is a strong association between perception of risk to HIV and risky sexual behavior, being female, employed clients, educational level of the clients and marital status particularly with clients in broken marriage
- The result revealed that risk perception has significant association with clients HIV test result.

11. Recommendation

- Improve behavioral communication approaches to enable people to be aware of their risks that help them to be protected from HIV/AIDS.
- Targeted HIV/AIDS prevention effort should be geared towards those individuals who believe their risk of acquiring HIV is higher than other clients.

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